

## **ABSTRACT OF THE DISCLOSURE**

The invention provides an attitude sensing apparatus for determining the attitude of a mobile unit that can reliably estimate an alignment angle between a GPS antenna coordinate system and an IMU coordinate system with good accuracy regardless of the magnitude of the alignment angle. Based on observation of the difference between a GPS angular velocity and an IMU angular velocity, an alignment angle estimating section estimates an alignment angle and sensor errors. An alignment angle adder and a sensor error adder cumulatively add and update the estimated alignment angle and sensor errors, respectively. The estimated alignment angle is fed back to an inertia data converter while the estimated sensor errors are fed back to an inertia data correcting section. The apparatus repeatedly performs estimation until the estimated alignment angle gradually approaches a true alignment angle by successively feeding back estimated values to a flow of alignment angle estimation process.